Notice of Allowability	Application No.	Applicant(s)	
	10/799,034	CHOI ET AL.	
	Examiner	Art Unit	
	Quochien B. Vuong	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *03/12/2004*.

2. ☒ The allowed claim(s) is/are *1-30*.

3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☒ All b) ☐ Some* c) ☐ None of the:
      1. ☒ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☒ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 07/28/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Reasons for Allowance

1. Claims 1-30 are allowed over the cited prior art.

2. The following is an examiner's statement of reasons for allowance:

Regarding independent claims 1, 8, 15, 23, Takahashi et al. (US 5,881,099) disclose an apparatus and method for estimating a frequency offset to compensate for the frequency offset of the I and Q channel signals, in a receiving apparatus of a mobile communication system, said receiving apparatus downconverting the received signal by a predetermined carrier frequency, and outputting in-phase (I channel) and quadrature-phase (Q channel) signals, comprising: an adder for adding I and Q channel signals and outputting a sum channel signal containing one of a cosine component or a sine component, the I and Q channel signals being obtained by downconverting the signal symbols; a subtractor for subtracting the Q channel signal from the I channel signal and outputting a difference channel signal containing one of the sine component or the cosine component in correspondence with the sum channel signal (column 8, line 61-column 9, line 37); and a frequency offset estimator for receiving a first sum channel signal and a first difference channel signals (column 11, lines 40-59). And Lindoff et al. (US 6,725,024) disclose an apparatus and method for estimating a frequency offset to compensate for the frequency offset of the I and Q channel signals, in a receiving apparatus of a mobile communication system, said receiving apparatus for receiving a signal containing training symbols of a predetermined pattern inserted in a data symbol sequence, downconverting the received signal by a predetermined carrier frequency (column 3, line 65 – column 5, line 40). However, Takahashi et al. and Lindoff et al. fail

to teach or fairly suggest the apparatus and method wherein the frequency offset estimator for receiving a first sum channel signal and a first difference channel signals at a first point in time, receiving a second sum channel signal and a second difference channel signal at a second point in time, calculating a first phase value using the first sum channel signal and the first difference channel signal, calculating a second phase value using the second sum channel signal and the second difference channel signal, and estimating the frequency offset by determining the slope of a second-order line derived from the first and second phase values.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Priority

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

4. The information disclosure statement (IDS) submitted on 07/28/2004 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

5. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because there are some correction in figure 7 (i.e., BB has been crossed out and should be removed). Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

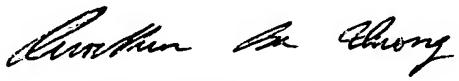
Takahashi et al. (US 5,610,939) disclose signal processing circuit for spread spectrum communciations.

Chien (US 2004/0203472) disclose compensation of I-Q imbalance in digital transceiver.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quochien B. Vuong whose telephone number is (571) 272-7902. The examiner can normally be reached on M-F 9:30-18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



QUOCHIEN B. VUONG
PRIMARY EXAMINER

Quochien B. Vuong
April 17, 2006.